

REMARKS/ARGUMENTS

The Examiner rejected claims 1 - 10 under §102(b), as being as being anticipated by U.S. Patent No. 5,966,686 of Heidorn et al. (“Heidorn”). As discussed more fully and completely below, Heidorn does not apply rules only to selected portions of a hierarchical tree according to a specified context, as set forth in Applicant’s claimed inventions. Therefore, Heidorn cannot anticipate nor render obvious any of the pending claims.

To further clarify the claimed inventions, Applicants have amended independent claims 1, 5, 6, 8 and 9 to more specifically recite the concept of applying rules “in a context.” As set forth in the patent specification: **“A ‘context’ is defined by the path of nodes from the root of a parse tree down to the node of interest.”** (Pending application at page 11). All independent claims now incorporate the novel concept of selective rule application *according to a specified context*.

As set forth in the independence claims, rules are applied in a context only to portions of a hierarchical tree. For example, claim 1 recites applying a reduce rule in a “*specified context ... only to an instance of a predetermined sub-hierarchy* of the hierarchical tree.” Claims 5, 6 and 7 recite enabling a user to “specify a rule *in a context, applicable only to an instance of a predetermined sub-hierarchy* of the hierarchical tree.” Claims 8 and 9 recites applying rules “*in a context*” to nodes, the rules having “suggested nodes”. Claim 10 recites applying rules to nodes of a hierarchical tree, where the rules have “*a context that is an instance of a predetermined sub-hierarchy* of the hierarchical tree.”

The Examiner rejected the independent claims based on a portion of Heidorn (col. 3, line 49 – col. 4, line 18), suggesting that Heidorn teaches applying rules only to an instance of a predetermined sub-hierarchy. Specifically, the Examiner asserts that Heidorn “teaches applying a rule to leaf nodes only or to pairs of leaf nodes only, which is equivalent to [the] claimed instance of a predetermined sub-hierarchy.” Applicants respectfully disagree. And in any event, Heidorn does not teach the concept of applying rules “in a context” as defined in the patent application.

As background to Heidorn's invention, he describes the standard and well-understood notion of bottom up parsing. The Examiner relies on Heidorn's statements in the background section for the assertion that Heidorn teaches applying rules only to an instance of a predetermined hierarchy (or only to suggested nodes – claims 8 and 9). The relevant paragraph is reproduced below:

In some NLP systems, syntax rules are applied in a top-down manner. The syntactic subsystem of the NLP system herein described applies syntax rules to the leaf nodes in a bottom-up manner. That is, the syntactic subsystem attempts to apply syntax rules one-at-a-time to single leaf nodes to pairs of leaf nodes, and, occasionally, to larger groups of leaf nodes. If the syntactic rule requires two leaf nodes upon which to operate, and a pair of leaf nodes both contain attributes that match the requirements specified in the rule, then the rule is applied to them to create a higher-level syntactic construct. For example, the words "my friend" could represent an adjective and a noun, respectively, which can be combined into the higher-level syntactic construct of a noun phrase. A syntax rule corresponding to the grammar rule, "noun phrase=adjective+noun," would create an intermediate-level noun phrase node, and link the two leaf nodes representing "my" and "friend" to the newly created intermediate-level node. As each new intermediate-level node is created, it is linked to already-existing leaf nodes and intermediate-level nodes, and becomes part of the total set of nodes to which the syntax rules are applied. The process of applying syntax rules to the growing set of nodes continues until either a complete syntax parse tree is generated or until no more syntax rules can be applied. A complete syntax parse tree includes all of the words of the input sentence as leaf nodes and represents one possible parse of the sentence. (Heidorn, col. 3, line 60 – col. 4, line 19).

However, this is nothing more than a description of "standard" parsing, in which rules apply only to the top-level phrase, which may consist of unaltered leaf nodes as well as intermediate nodes created by grouping leaf nodes and other intermediate nodes.

The claimed inventions address accessing deeper nodes than the readily accessible top-level phrase of the parse tree.' To use Heidorn's example, say an intermediate node "adjective" is built to represent "my", and an intermediate "noun" node is built on top of "friend". Then the standard method described by Heidorn applies a rule such as "noun-phrase <- adjective noun" to further group the adjective and noun to a noun phrase. The claimed method is novel in that it enables further processing (e.g., to create new nodes and groupings) *within* the created noun phrase node, whereas the standard method does not allow a parser further access into the noun phrase. So, in this example, a user of the claimed invention can

specify a rule that says: look within the root of the parse tree and at all noun phrases directly below that. Then the user can apply rules within that context to gather evidence, undo mistakes, and otherwise reprocess, augment, and correct the processing previously performed by the parser.

Heidorn does not teach applying rules in a particular context. As set forth above, a context is defined "**by the path of nodes from the root of a parse tree down to the node of interest.**" The discussion in Heidorn does not teach or suggest applying rules in a "context", i.e., in a path from the root of the parse tree down to a node of interest. Heidorn merely suggests the grouping of nodes and pairs of nodes.

This notion of specifying the context in which a rule is applied, e.g., as a path from the root to the noun phrases to the nouns and so on, for further processing and reprocessing is reflected in each of the independent claims, as discussed above.

This context-specific application of rules provides substantial advantages over prior systems such as Heidorn. For example and without limitation, the claimed inventions provides optimal compatibility with multi-pass text analysis. While standard (bottom up or top down) parsers apply to the top level phrase in the tree repeatedly in a "single pass", the claimed method and programming language allows for multiple passes in the parse tree. In this way, a user can direct the parser to look only at noun phrases in one pass, for example to gather information about them. Then similarly a user can point the parser to verb phrases in a subsequent pass. Then a third pass can operate at the sentential level, looking at this previously gathered data to establish relationships between noun phrases and verb phrases.

This concept enables a user to build contexts, that is, to process things a user is more confident about first, whether at the morphological, lexical, syntactic, semantic, or even discourse level. And then, using high confidence knowledge as context, a user can address, revisit, disambiguate, and correct problems with this previously gathered information.

Armed with the method of the claimed inventions, which allows us to re-examine any decision made in constructing the parse tree, a user may make optimal use of a multi-pass text analysis methodology.

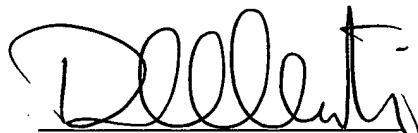
Since Heidorn fails to disclose or suggest applying rules in a context only to predetermined sub-hierarchies or suggested nodes of a tree, it cannot anticipate nor render obvious any of independent claims 1 or 5-10, or any claims depending from those claims (e.g., claims 2-4).

CONCLUSIONS

For all of these reasons, Applicants respectfully assert that all of claims 1-10 are in condition for allowance. The Examiner's early reconsideration is respectfully requested. If the Examiner has any questions, the Examiner is invited to contact Applicant's attorney at the following address or telephone number:

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Respectfully submitted,


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